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Gschwend, Thomas; Johnston, Ron; Pattie, Charles

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Split-Ticket Patterns in Mixed-Member Proportional Election Systems: Estimates and Analyses of Their Spatial Variation at the German Federal Election, 1998

THOMAS GSCHWEND, RON JOHNSTON AND CHARLES PATTIE*

Mixed-member proportional election systems give voters two choices – one for a party candidate in a first-past-the-post single-member constituency election and the other for a party list in a multi-member constituency. Some will vote a straight ticket (i.e. vote for the same party at each contest); others may vote a split-ticket. Although such an electoral system has been operating in Germany since 1953, very little work has been done on variations between constituencies in either the volume of split-ticket voting or the direction of the switching involved. Using an entropy-maximizing method, this article reports estimates of the pattern of straight-ticket and split-ticket voting in each of Germany's 328 constituencies at the 1998 federal elections. Analyses of the variations show that the patterns are consistent with patterns of party strength at the constituency level: the stronger a party's performance at the 1994 election, the better its ability to retain the support of straight-ticket voters in 1998, to limit the out-flows of split-ticket voters, and to attract split-ticket voters who supported another party in the list contest.

The recent adoption of the mixed-member proportional (MMP) or additional member (AMS) electoral system in countries such as New Zealand, Scotland and Wales, as well as consideration of its use elsewhere (as in Portugal) have stimulated interest in the degree and nature of split-ticket voting which such a two-vote system permits.¹ However, relatively little research has been reported (in the English language) on certain aspects of split-ticket voting in the country that has used MMP for all of its federal elections since 1953 – Germany (the Federal Republic of (West) Germany until 1990; the reunited state thereafter).²

In particular, there has been very little work on spatial variations in the volume and direction of split-ticket voting, partly because of the lack of relevant data. Survey data have been used to explore differences in the characteristics of straight-ticket and split-ticket voters,³ but these do not allow study of how many voters were in each category in each of the country's 328 constituencies. In order to study variations between constituencies, scholars employ constituency level data. From aggregate data inter-constituency variations

* Department of Political Science, State University of New York at Stony Brook and Mannheimer Zentrum fuer Europaeische Sozialforschung (MZES), University of Mannheim; School of Geographical Sciences, University of Bristol; and Department of Geography, University of Sheffield, respectively.

¹ On the MMP system generally, see M. S. Shugart and M. P. Wattenberg, *Mixed-Member Electoral Systems: The Best of Both Worlds?* (New York: Oxford University Press, 2001). The book contains two essays on Germany: S. E. Scarrow, 'Germany: The Mixed-Member System as a Political Compromise', pp. 55–69; and H-D. Klingemann and B. Wessels, 'The Political Consequences of Germany's Mixed-Member System: Personalization at the Grass Roots?', pp. 279–96.

² Indeed, the topic is mentioned in only one of the fourteen chapters in a recent collection of essays on German electoral behaviour: C. J. Anderson and C. Zelle, eds, *Stability and Change in German Elections: How Electorates Merge, Converge, or Collide* (Westport, Conn.: Praeger, 1998).

³ See T. Gschwend, 'Is Ticket Splitting Strategic? Evidence from the 1998 Election in Germany' (paper presented at the annual meeting of the Midwest Political Science Association, 2000).

in these aspects of voter behaviour can only be investigated using net measures of the difference between a party's list and constituency votes, for example the 'desertion rate' concept.⁴ The problem is that these measures say nothing about either the volume of straight-ticket voting for each party or the gross pattern of inter-party ticket-splitting in each constituency. In this article, we present estimates of not just the number of split-ticket and straight-ticket votes in each constituency, but also the total volume of inter-party moves there. These are then analysed in the context of a theory of split-ticket voting based on rational choice concepts.

SPLIT-TICKET VOTING IN GERMANY, 1998

Germany provides ideal examples of split-ticket patterns among different parties, because essentially the same rules have been in place there for almost fifty years. Thus, we expect that, whatever split-ticket patterns might exist in MMP systems in general, they are likely to be crystallized within the voting patterns of a recent German election.

The German MMP system presents electors with two ballots, one for the local district (or constituency) in which they live and the other for their *Land*. The former is used in a first-past-the-post contest to elect a constituency representative; the latter is a party list ballot. Half the Bundestag seats are occupied by constituency representatives, and the other half by representatives selected from the party lists. The number in the latter category is selected so as to ensure proportional representation for each party, taking into account its number of constituency representatives. Parties are only allocated list seats if they either (1) win at least 5 per cent of the list votes nationally or (2) win at least three of the constituency contests nationally.⁵ (Thus, for example, if a party won 25 per cent of the list votes it would be entitled to 164 of the 656 Bundestag seats. If it won 120 constituency contests, then a further 44 seats would be allocated to the party and would be filled by its list candidates.)⁶

⁴ G. W. Cox, *Making Votes Count: Strategic Co-ordination in the World's Electoral Systems* (Cambridge: Cambridge University Press, 1997). Bawn employs a similar 'candidate vote gap' concept, see Kathleen Bawn, 'Voter Responses to Electoral Complexity: Ticket Splitting, Rational Voters and Representation in the Federal Republic of Germany', *British Journal of Political Science*, 29 (1999), 487–505. Further aggregate measures are employed by S. H. Barnes, F. Grace, J. K. Pollock and P. W. Sperlich, 'The German Party System in the 1961 Federal Election', *American Political Science Review*, 56 (1962), 899–914; L. E. Dutter, 'Constituency Variations in Aggregate Voter Behavior across the 1965–83 German Federal Elections', *Electoral Studies*, 5 (1986), 61–71; E. Jesse, 'Split-Voting in the Federal Republic of Germany: An Analysis of the Federal Elections from 1953 to 1987', *Electoral Studies*, 7 (1988), 109–24; and W. P. Shively, 'The Elusive Psychological Factor: A Test for the Impact of Electoral Systems on Voters' Behavior', *Comparative Politics*, 3 (1970), 115–25; D. Spafford, 'Electoral Systems on Voters' Behavior: Comment and a Further Test', *Comparative Politics*, 5 (1972), 129–34. Moreover, S. L. Fisher, 'The Wasted Vote Thesis: West German Evidence', *Comparative Politics*, 5 (1973), 293–9, and H. Schoen, 'Split-Ticket Voting in German Federal Elections, 1953–90: An Example of Sophisticated Balloting?' *Electoral Studies*, 18 (1999), 473–96, employ the German representative electoral statistics (*repräsentative Wahlstatistik*). These data are a representative sample of actual voters. The results, however, published by the German Federal Statistical Bureau are aggregated on the state level and, thus, do not permit an assessment of inter-constituency variations of split-ticket patterns.

⁵ For a full discussion of the German system, see K. Bawn, 'The Logic of Institutional Preferences: German Electoral Law as a Social Choice Outcome', *American Journal of Political Science*, 37 (1993), 965–89; S. E. Scarrow, 'Political Parties and the Changing Framework of German Electoral Competition', in Anderson and Zelle, eds, *Stability and Change in German Elections*, pp. 301–22.

⁶ Its percentage of the seats may not be exactly the same as its percentage of the votes, depending on what percentage of the latter is won by parties that do not qualify for Bundestag representation. If a party wins more constituency seats than its list vote entitles it to, it keeps all of those seats, with the Bundestag being expanded accordingly.

Five political parties dominate contemporary German electoral politics. The two largest – the Christian Democratic Union (CDU)⁷ and the Social Democratic Party (SPD) – predominate, with at least one of them being the major party in every government since the federal state was established in 1949; they occupy the right and left wings of the political spectrum respectively. Of the three smaller parties, one – the Free Democratic Party (FDP) – is liberal-centrist; from the autumn of 1982 until the federal election of 1998 it formed coalition governments with the CDU.⁸ The other two are on the left – the Green party and the Party of Democratic Socialism (PDS; the successor party to the Communists who ruled in East Germany until 1989). There are also a number of small ‘other’ parties, which attracted just over 5 per cent of the list votes in 1998, and just under 3 per cent of the constituency votes. In 1988 the maximum numbers of votes cast for ‘other parties’ was 12.4 per cent in a constituency contest; and 13.6 per cent list votes in a constituency.

These electoral and party systems allow electors to vote split tickets if they wish – in other words, to support different parties in the constituency and list contests. The volume and direction of such split-ticket voting can be estimated using opinion-poll data. The matrix for 1998 (derived from the German National Post-Election Study)⁹ is presented in Table 1. The figures on the main diagonal indicate that 77.9 per cent of the respondents voted a straight party ticket – i.e. voted for the same party in both the constituency and the list contests;¹⁰ over one in five, therefore, voted a split ticket. This election marks an all-time high for the number of split-ticket voters in federal elections in Germany.¹¹ Comparison of the matrix and column percentages shows a familiar pattern that has previously been recognized by many scholars of German politics; the two largest parties – the CDU and the SPD – received larger shares of the constituency vote than of the list vote, whereas the smaller parties won larger shares of the list vote than the candidate votes.

The off-diagonal cells in the matrix show the direction and volume of split-ticket voting. If we assume that votes for the list indicate the electorate’s preferences among parties with regard to relative representation in the Bundestag, then the direction of flow goes from list votes to constituency votes.¹² A comparison down the columns provides the clearest indication of the direction of splitting. The column percentages are shown in brackets in Table 1. They indicate that the great majority of supporters of the two largest parties – 93 and 88 per cent for the CDU and SPD respectively – voted for their party of choice in both contests, as did a small majority of those voting for the PDS in the list contest. Only minorities of the list voters for the FDP and the Greens supported their respective party’s

⁷ For brevity here, we include the Bavarian Christian Social Union (CSU) within the CDU.

⁸ Before the autumn of 1982 the FDP was in a coalition government with the SPD; it switched its allegiance and enabled the right to replace the left in government without an election being held.

⁹ The German National Post-Election Study (ZA-No. 3073) can be obtained from the Central Archive for Empirical Social Research, University of Cologne, Germany. Superior estimates could have been derived from the German representative electoral statistics (representative *Wahlstatistik*) published by the Federal Statistical Bureau. Data collection was suspended, however, for the 1994 and 1998 elections. Otherwise, this data could have been used to obtain the estimates in Table 1.

¹⁰ This is probably a slight over-estimate; it is possible that somebody who voted for a party in the ‘Other’ category in both contests actually voted for two separate parties. In order to get unbiased marginal value estimates we followed the suggestion of the survey conductors and weighted the raw data by an appropriate weight accounting for recall and sociodemographic biases.

¹¹ Klingemann and Wessels, ‘The Political Consequences of Germany’s Mixed-Member System’.

¹² A similar interpretation is that split-ticket behaviour signals certain coalition preferences. This cannot be addressed with aggregate-level data, though. See T. Gschwend, ‘Ticket-Splitting and Strategic Voting in Mixed Electoral Systems’ (paper presented at the annual meeting of the American Political Science Association, San Francisco, 2001, and available at <http://web.polmeth.ufl.edu/>).

TABLE 1 *Split-Ticket Voting in Germany, 1998*

Constituency	List						Total
	CDU	FDP	SPD	Green	PDS	Other	
CDU	32.71 (92.74)	3.90 (61.42)	2.24 (5.44)	0.08 (1.18)	0.20 (4.07)	2.06 (40.30)	41.19
FDP	0.69 (1.96)	1.36 (21.41)	0.25 (0.61)	0.00 (0)	0.05 (1.02)	0.00 (0)	2.35
SPD	1.40 (3.97)	1.09 (17.16)	36.23 (88.11)	3.88 (57.30)	1.52 (30.95)	0.78 (15.23)	44.90
Green	0.15 (0.43)	0.00 (0)	1.34 (3.26)	2.68 (39.60)	0.37 (7.54)	0.00 (0)	4.54
PDS	0.11 (0.31)	0.00 (0)	0.70 (1.70)	0.12 (1.77)	2.70 (54.99)	0.05 (0.98)	3.68
Other	0.21 (0.60)	0.00 (0)	0.36 (0.88)	0.01 (0.14)	0.07 (1.43)	2.22 (43.44)	2.87
Total	35.27	6.35	41.12	6.77	4.91	5.11	

Note: In each pair of rows, the first set of figures shows the volume of ticket-splitting as a percentage of the matrix total, and the second set (in brackets) shows it as a percentage of the column total.

Key to parties: CDU – Christian Democrats; FDP – Free Democrats; SPD – Social Democrats; PDS – Democratic Socialists.

candidate in the constituency contest, however: over 60 per cent of those who voted for the FDP in the list contest supported the CDU candidate in the constituency vote and just under 60 per cent of the Green party's list voters cast their constituency vote for the SPD candidate (as did a majority of those who voted for the PDS in the list but not in the constituency contest). Thus, the split tickets from small parties favour the larger parties. Of those who voted for a party in the 'other' category in the list contest, 43 per cent also voted for an 'other' candidate in the constituency contest, with a large percentage of the remainder switching their vote to the CDU and most of the rest supporting the SPD candidate.

The divisions in German politics are remarkably clear. There was little splitting of tickets between the two main party blocs in 1998 – 'right' (CDU and FDP) and 'left' (SPD, PDS and Greens). Fully 92.9 per cent of those who voted for one of the parties of the 'right' in the list contest also voted for one of their candidates in the constituency contests – with the only major leakage being from the FDP to the SPD (17 per cent of those who voted for the FDP list voted for an SPD constituency candidate). Similarly, 93.8 per cent of those who voted for one of the three 'left' parties in the list contest also voted for one of those parties' candidate in the constituency contests.¹³ But is it the same everywhere?

¹³ Another reason for cross-bloc ticket splitting is that voters might prefer a coalition between the two major parties, CDU and the SPD. Although splitting a ticket between these two parties in fact does happen, it does not signal any clear coalition preference and, therefore, does not enhance the chance of such a coalition. A coalition between the two major parties is theoretically always possible independent from any ticket-splitting rationales.

THEORIES OF SPLIT-TICKET VOTING

The 1998 German federal election was thus characterized by a substantial volume of split-ticket voting, most of which involved people who favoured one of the smaller parties in the list contest voting for one of the two large parties in the constituency contests. Furthermore, there was little inter-bloc split-ticket voting, except that one in six of the FDP's list supporters voted for an SPD constituency candidate.

Why should such split-ticket voting occur? In general, the smaller parties have very little chance of winning in the constituency contests, and thus a constituency vote for one of them is almost certainly a wasted vote.¹⁴ In the 1994 Federal election, for example, 221 of the 328 constituency seats were won by the CDU and 103 by the SPD, leaving just four won by a smaller party – all by the PDS.¹⁵ Furthermore, the smaller parties are not well placed to win in the great majority of constituencies; there was only one in 1994 where the FDP won more than 10 per cent of the votes. The Greens won more than that in twenty-three constituencies, but they received more than 20 per cent of the vote in only two (in one of which they came a close third behind the CDU and SPD candidates). The PDS received more than 10 per cent in seventy-two constituencies and more than 20 per cent in twenty-nine, but apart from the four that it won it came close to victory in only two others.

Given the situation, therefore, if most supporters of the smaller parties voted for its candidate in the constituency contest they would, in effect, be wasting their votes on a 'hopeless cause'. Rather than do this, it would be rational in most constituencies for them if, having voted for their party of choice in the list contest, they then voted in the local constituency contest either: (1) for their preferred choice among the two large parties; or (2), if its candidate had no chance of victory, for another party in their bloc (this would only apply to the left in 1998). The data in Table 1 suggest that such tactical appreciation to avoid wasting the constituency vote dominated split-ticket patterns in 1998; most of the splits by supporters in the smaller parties at the list contest were intra-bloc and were directed towards the large parties with the greatest chance of constituency victory. But this does not account for the substantial splitting from the FDP to the SPD: one in five FDP list voters also supported the party's constituency candidate, and one in six split to support the SPD's candidate.

Research in social and political psychology has shown that voters employ simplifying strategies or short cuts, like party schemas, to cope with their limited resources instead of engaging in a comprehensive 'calculus of voting'.¹⁶ On the ballot for the constituency vote in Germany, candidates are presented by their names and respective party labels. Voters presumably employ the *party label heuristic* in order to facilitate their constituency vote decision. Instead of tuning into the local race and gathering costly information about the local party candidates it seems cognitively more efficient to cast their constituency vote simply for the local candidate of their most preferred party. Thus, they simply infer from the party label on the ballot what candidate to vote for. By this logic, a straight ticket is

¹⁴ On which, see M. Duverger, *Political Parties* (New York: Wiley, 1954) and G. W. Cox, *Making Votes Count* (New York: Cambridge University Press, 1997).

¹⁵ For a full list for the period 1949–93, see T. D. Lancaster, 'Candidate Characteristics and Electoral Performance: A Long-Term Analysis of the German *Bundestag*', in Anderson and Zelle, eds, *Stability and Change in German Elections*, pp. 281–300, at p. 284.

¹⁶ See M. Lodge and R. Hamil, 'A Partisan Schema for Political Information Processing', *American Political Science Review*, 80 (1986), 505–19; S. T. Fiske and S. E. Taylor, *Social Cognition* (New York: McGraw-Hill, 1991).

a vote for the most preferred candidate as well as the most preferred party. We therefore interpret the number of straight-ticket voters for a particular party as the *strength* of that party at the constituency level.

Why should small parties field candidates in the first place, if they have no realistic chance of winning the constituency contest? Mixed-member systems combine two different components and, as recent research about these systems shows,¹⁷ the effects of these components – first-past-the-post for the constituency vote and proportional representation for the list vote – might not be independent. In fact, there is evidence of so-called *contamination effects*. By fielding a candidate in the constituency race, a small party might heighten voter awareness. Thus, we expect less ticket-splitting in favour of the larger party candidate if the smaller parties field their own candidate in the constituency race.

Testing whether these notions of split vote patterns are valid – universally across parties – is difficult with either aggregate data showing only the total number of votes cast in each constituency for each party in each of the two contests, or with survey data for a sample of electors. What is needed is data on the volume and direction of straight-ticket and split-ticket voting in each constituency. Gschwend has produced estimates of split-ticket and straight-ticket voting in each constituency, using King's EI procedure which estimates individual behaviour from aggregate data, given certain constraints.¹⁸ But, because of these constraints, he was only able to produce estimates for each party (the number of FDP and non-FDP list voters who voted either a split or a straight ticket, giving a series of 2×2 matrices). Here, we use an alternative, entropy-maximizing (EM) procedure which estimates the entire matrix of vote splits for each constituency.¹⁹

CONSTITUENCY SPLIT-TICKET MATRICES

The entropy-maximizing method produces maximum-likelihood estimates of the individual constituency vote-splitting matrices, using three sets of constraints – the number of votes cast for each party in each constituency in the list contest; the number of votes cast for each party in each constituency in the constituency contest; and the national split-ticket matrix (derived from a survey such as that reported in Table 1, grossed up so that the sum of all cell values equals the national electorate). The estimates are the most likely pattern of splitting in each constituency consistent with the results of the two contests there and the national pattern: the estimated number of split-ticket votes in each constituency should sum to the two sets of vote totals there and the estimated number of split-ticket votes across all constituencies should sum to the national matrix.²⁰ The procedure has been used

¹⁷ See E. S. Herron and M. Nishikawa, 'Contamination Effects and the Number of Parties in Mixed-Superposition Electoral Systems', *Electoral Studies*, 20 (2001), 63–86.

¹⁸ See T. Gschwend, 'Strategic Voting in Germany: Evidence Employing King's Ecological Inference' (paper presented at the annual meeting of the Southern Political Science Association, 1999); G. King, *A Solution to the Ecological Inference Problem: Reconstructing Individual Behavior from Aggregate Data* (Princeton, N.J.: Princeton University Press, 1997).

¹⁹ For an introduction, see R. J. Johnston and C. J. Pattie, 'Ecological Inference and Entropy-Maximizing: An Alternative Estimation Procedure for Split-Ticket Voting', *Political Analysis*, 8 (2000), 333–45.

²⁰ The procedure treats each individual constituency as an independent entity, with no spatial autocorrelation affecting neighbouring constituencies. Given that each constituency is a separate contest (with different parties and histories, etc.), this assumption of independence is entirely realistic.

TABLE 2 *Estimates of Straight-Ticket and Split-Ticket Voting across the Constituencies, in Those Constituencies where the Relevant Party(ies) Fielded Candidates: Summary Statistics*

From	To	Mn	Mx	Me	SD	N
CDU	CDU	83.2	94.0	91.4	1.2	327
CDU	FDP	1.2	10.6	2.7	0.9	326
CDU	SPD	3.1	5.6	4.3	0.4	327
CDU	Green	0.2	1.3	0.5	0.2	324
CDU	PDS	0.1	1.4	0.3	0.3	247
CDU	Other	0.1	2.2	0.9	0.3	323
FDP	CDU	29.0	69.4	56.1	5.0	326
FDP	FDP	14.7	90.0	27.2	7.0	327
FDP	SPD	9.7	21.9	16.9	1.9	327
SPD	CDU	3.8	6.5	5.1	0.5	327
SPD	FDP	0.4	4.4	0.8	0.3	327
SPD	SPD	80.0	92.1	88.0	2.0	328
SPD	Green	1.6	10.8	3.8	1.3	325
SPD	PDS	0.6	7.2	1.7	1.3	248
SPD	Other	0.1	3.1	1.2	0.4	324
Green	CDU	0.6	1.4	1.0	0.1	325
Green	SPD	28.3	71.5	55.2	7.0	325
Green	Green	24.2	70.9	42.3	7.6	325
Green	PDS	0.4	7.5	1.7	1.4	246
Green	Other	0.0	0.5	0.2	0.1	321
PDS	CDU	1.4	6.4	4.3	1.3	247
PDS	FDP	0.5	6.7	1.6	0.6	247
PDS	SPD	10.4	51.5	34.8	10.5	248
PDS	Green	2.4	28.8	9.5	4.3	246
PDS	PDS	26.3	84.1	48.2	15.8	248
PDS	Other	0.1	5.2	1.7	0.9	244
Other	CDU	14.9	57.9	32.4	6.1	323
Other	SPD	6.8	24.0	13.3	2.7	324
Other	PDS	1.9	25.8	8.3	6.0	244
Other	Other	8.5	72.0	48.2	11.0	324

Note: Each of the figures is the estimated percentage of those voting for the first-named party in the list contest who voted for the second-named in the constituency contests.

Key: Mn – minimum; Mx – maximum; Me – mean; SD – standard deviation; N – number of constituencies with candidates for the relevant party(ies).

successfully in a range of situations since it was first applied to voting studies – including split-ticket voting in the United States and New Zealand.²¹

Summary statistics for the estimated constituency matrices are given in Table 2: the percentage figures refer to the list vote totals (the first row of Table 2, for example, indicates

²¹ R. J. Johnston and A. M. Hay, 'The Geography of Ticket-Splitting: A Preliminary Study of the 1976 Elections using Entropy-Maximizing Methods', *The Professional Geographer*, 36 (1984), 291–6; and R. J. Johnston and C. J. Pattie, 'Constituency Campaign Intensity and Split-Ticket Voting: New Zealand's First Election under MMP, 1996', *Political Science*, 51 (1999), 164–81.

that on average 91.4 per cent of CDU list voters also voted for the CDU's constituency candidate, with a standard deviation of 1.2 and a range from 83.2 to 94.0).²² The final column shows the number of constituencies involved, which in most cases is the vast majority: the SPD fielded candidates in all 328 constituencies; the CDU and the FDP each fielded candidates in 327 and the Greens in 325; the PDS fielded 248 constituency candidates and there was a candidate from an 'other' party in 324 cases.

There was relatively little variation for the two large parties in their percentage of straight-ticket votes across all constituencies where they fielded candidates – from 83.2 to 94.0 per cent in the case of the CDU and from 80.0 to 92.1 per cent for the SPD. The variation was much greater for the smaller parties, however: from 14.7 to 90.0 per cent for the FDP; from 24.2 to 70.9 for the Greens; and from 26.3 to 84.1 for the PDS. There were also substantial variations in the splits involving 'other' parties. There was much greater relative variation in the volume of ticket-splitting, however, especially those splits involving the smaller parties. Of those who voted for the PDS in the list contests, for example, the percentage who voted for the SPD in the constituency contest ranged from 10.4 to 51.5 (with a mean of 34.8 and a standard deviation of 10.5); and there was a tenfold variation in the percentage who switched their support at the constituency level to the Greens.

ACCOUNTING FOR THE PATTERNS OF SPLIT-TICKET VOTING

These straight-ticket and split-ticket estimates for all 328 constituencies provide a rich resource with which to test hypotheses regarding the pattern and direction of split-ticket voting. This allows us both to explore potential relationships and to test them formally using regression analysis.

For each party, our original expectations were that, in line with the concept of tactical split-ticket voting: (1) the greater a party's chance of victory in the constituency contest the greater the percentage of its list voters who would vote a straight ticket by supporting it in the constituency contest also; and (2) the greater the chances of another party in the relevant bloc winning in the constituency contest, the greater the number of split tickets to it from those who voted for another party within the bloc in the list contest. We explored several measures of a party's chances of victory, including the winner's margin of victory at the previous (1994) election, the loser's margin of defeat then, and the margin of victory between the two main parties. By far the best fits, however, were with each party's percentage of the votes cast in the constituency contest at the 1994 election (the context in which electors decided how to vote four years later), and these are illustrated here with scatter diagrams (in which we separately identify constituencies in the former East and West Germany, to account for the different nature of the party systems: whereas the PDS contested all of the seats in the former East Germany in both 1994 and 1998, it fielded

²² These means are not the same as the system-wide figures in Table 1, in part because of skewed distributions, and in part because the national matrix had to be smoothed – or 'Mostellerized' (see Bo Särilvik and Ivor Crewe, *Decade of Dealignment* (Cambridge: Cambridge University Press, 1983) – so that its row and column totals equalled the national vote distributions. This Mostellerization corrects for deviations between the overall national distribution of votes in each of the two contests as derived from the sample survey split-ticket matrix (i.e. the FDP list vote total derived from that matrix is the sum of the percentages who voted for each party in the constituency contest saying that they voted FDP in the list contest) and the actual result. This involved moving just 4,735 voters (out of 49.3 million), indicating that the original matrix fitted the constraints extremely well.

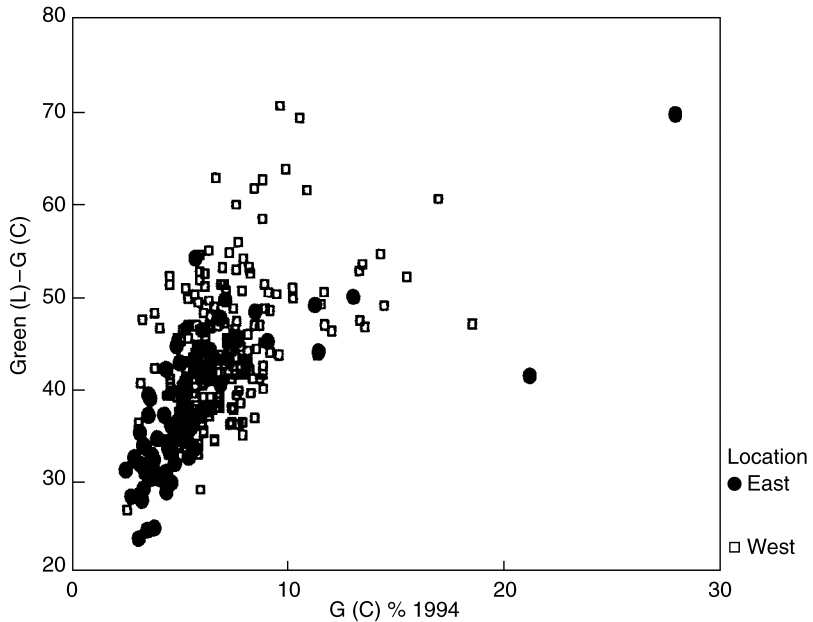


Fig. 1. The relationship between Green party straight-ticket voting in 1998 and Green party constituency vote in 1994 (constituencies with a Green candidate in 1998 only)

candidates in only 49 per cent in the former West Germany in 1994 and 68 per cent in 1998).²³

Figures 1–3 show these relationships for three cases involving the Green party; in each, the relevant party's chances of victory in a constituency contest are expressed as its percentage of the votes cast there in the comparable contest at the previous federal election in 1994. In Figure 1 the percentage of Green list voters voting for the Green candidate in 1998 is positively related to the party's constituency performance in 1994 (with the exception of the small number of constituencies which had no Green candidate at the former election). Even though the party had very little hope of winning a constituency seat, the better its performance in 1994 the larger the percentage of its 1998 list supporters who were loyal to the party in both contests then; this suggests that the party is better able to mobilize constituency-contest support where it has a strong local presence. In general, the Greens performed better in constituencies in the former West than East Germany, but there is no evidence of different relationships in the two parts of the country.

Figures 2 and 3 show the splits from the Greens to the PDS and the SPD respectively. There is a very clear relationship in the former case: the stronger the PDS vote in 1994 the larger the percentage of Green list voters in 1998 who supported the PDS constituency candidate in 1998 – which suggests that the stronger the PDS's local party the greater its ability to mobilize support for its constituency candidate. Figure 3 also shows a positive,

²³ With regard to marginality, we expected that the greatest volume of intra-bloc ticket-splitting from a small to a large party would occur in constituencies where that latter either won in 1994 by a small margin only or lost by a small margin – i.e. that the relationship would have an inverted-U shape (e.g. FDP–CDU splits would be largest where the CDU chances of either retaining a seat or winning it from the SPD were high). We found no evidence of such relationships, however.

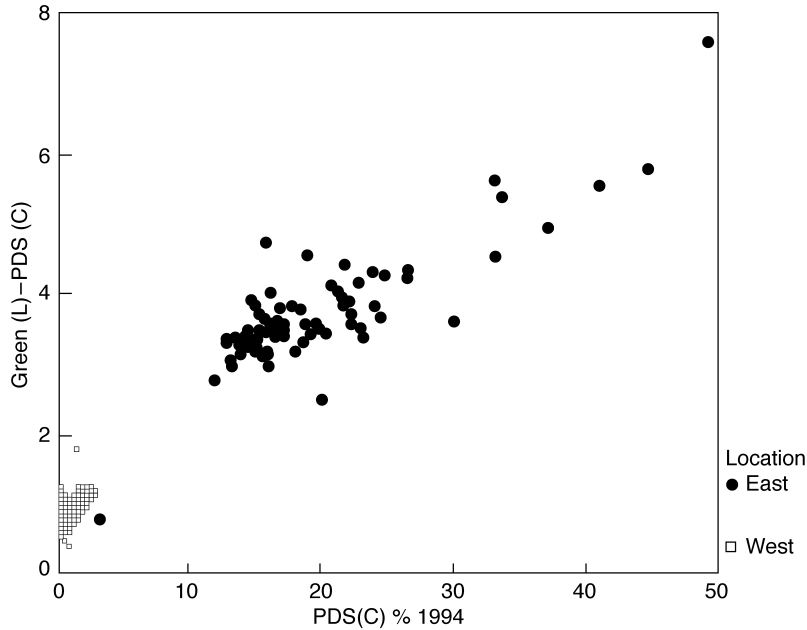


Fig. 2. The relationship between Green–PDS split-ticket voting in 1998 and PDS constituency vote in 1994 (constituencies with Green and PDS candidates in 1998 only)

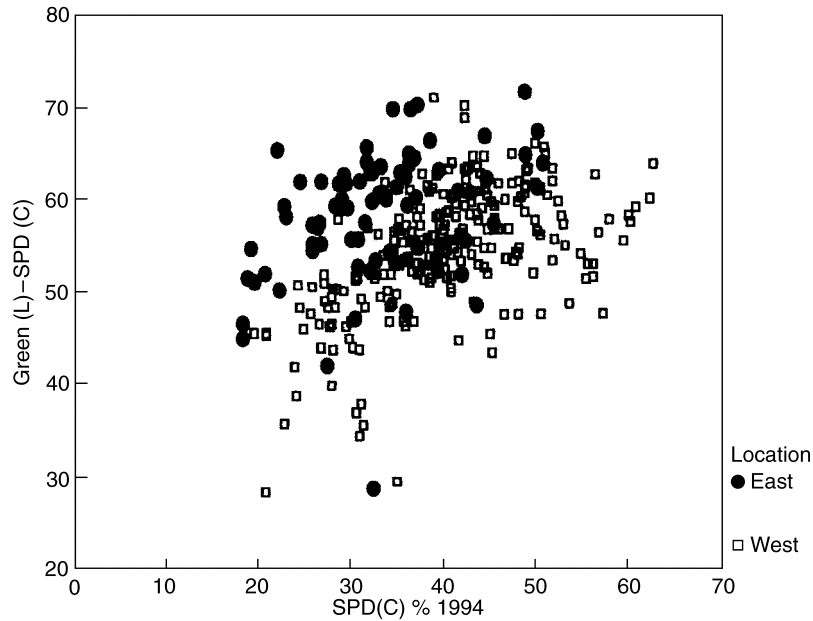


Fig. 3. The relationship between Green–SPD split-ticket voting in 1998 and SPD constituency vote in 1994 (constituencies with a Green candidate in 1998)

though weaker, relationship between SPD strength in 1994 and the percentage of Green list voters who supported the SPD candidate in the constituency contest – with in general more split votes going to the SPD in the East than in the West.

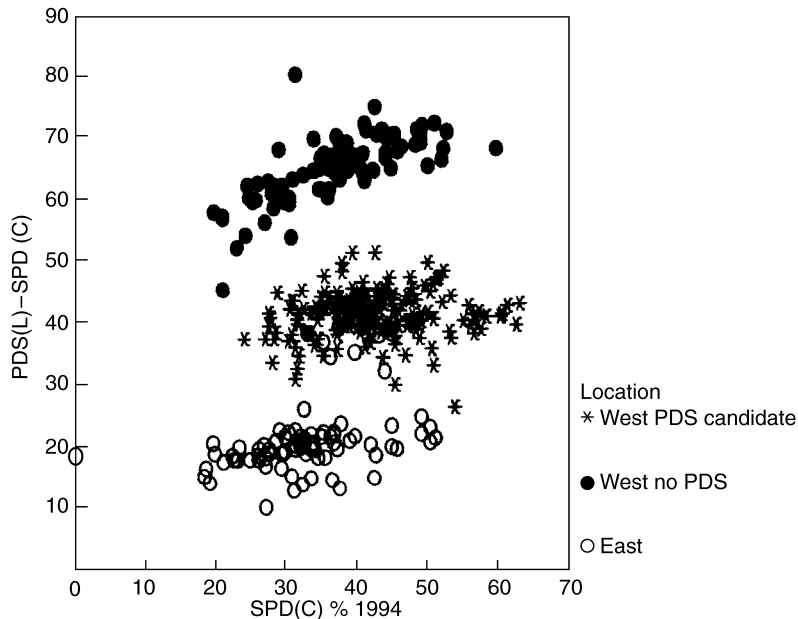


Fig. 4. The relationship between PDS–SPD split-ticket voting in 1998 and SPD constituency vote in 1994

The volume of splits involving PDS list voters reflects not only the performance of the other parties in 1994 but also whether the PDS fielded a constituency candidate in 1998. This is known as *contamination effect* in mixed-member systems;²⁴ it is illustrated in Figure 4, where the constituencies in the former West Germany are divided into those with and without a PDS candidate (all constituencies in the *Länder* in the former East Germany had a PDS candidate in 1998). Splits from the PDS to the SPD are, not surprisingly, smallest in almost all of the East German constituencies and largest in the West German constituencies with no PDS candidate. Among the West German constituencies with a PDS candidate, there was little variation in the number of split-ticket votes relative to the SPD's 1994 performance, but where there is no PDS candidate then the better the SPD performance in 1994 the larger the percentage of PDS list voters in 1998 who switched their constituency vote to the SPD.

There was a clear positive relationship in the 'right' party bloc between the FDP's performance on the constituency level in 1994 and the percentage of its 1998 list voters who also voted for the party in the constituency contest (Figure 5); as with the Greens, the FDP was better able to mobilize straight-ticket votes where it was relatively strong, even though its chances of victory were extremely slight.

The data in Tables 1 and 2 show one substantial split-ticket component that involves cross-bloc voting – the one-in-six FDP list voters in 1998 who voted for the SPD candidate in the constituency contest. Figure 6 shows a very strong positive relationship between the size of this split and the SPD's performance in 1994 – i.e. its chances of victory in 1998. This came about, we suggest, because – as in other countries – splits are influenced by party campaigns.²⁵ In general, the stronger a party's performance in a constituency at

²⁴ Herron and Nishikawa, 'Contamination Effects and the Number of Parties'.

²⁵ See R. J. Johnston and C. J. Pattie, 'Campaigning and Advertising: An Evaluation of the Components of Constituency Activism at Recent British General Elections', *British Journal of Political Science*, 28 (1998), 677–86.

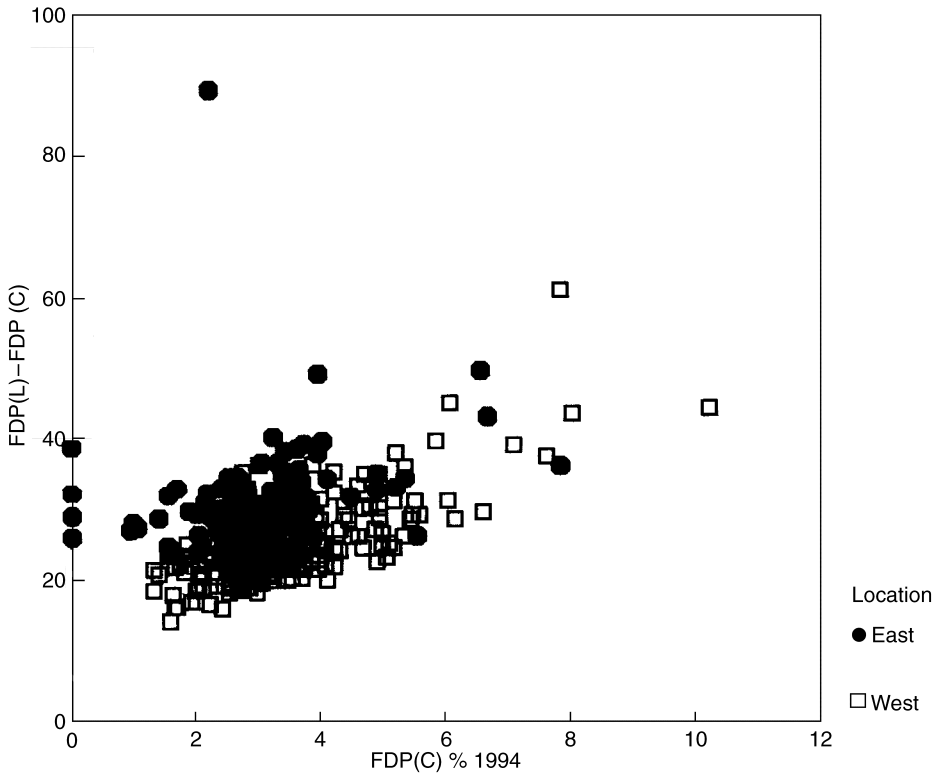


Fig. 5. The relationship between FDP straight-ticket voting in 1998 and FDP constituency vote in 1994 (constituencies with FDP candidates in 1998 only)

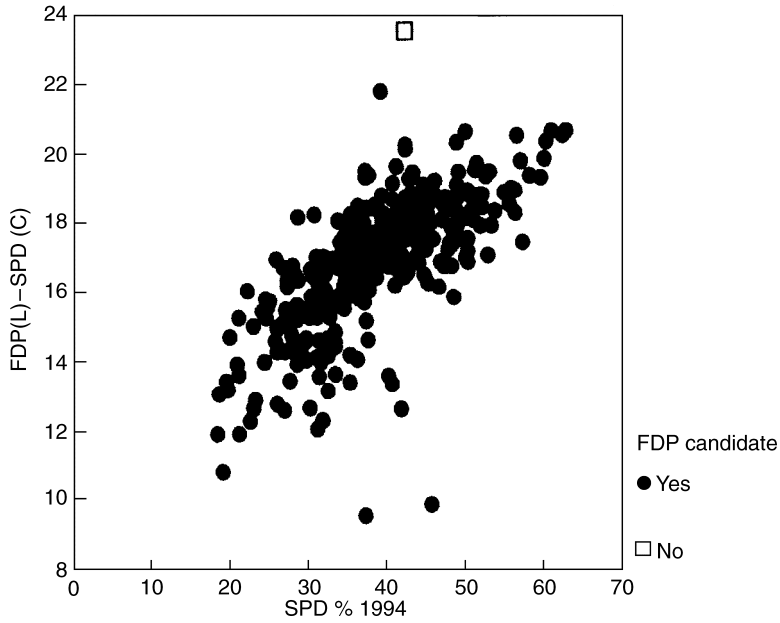


Fig. 6. The relationship between FDP-SPD split-ticket voting in 1998 and SPD constituency vote in 1994

one election, the more intensive its local campaign there at the next election and, if such campaigning is effective, the greater the volume of split-ticket voting favouring that party as a consequence. The pattern in Figure 6 is consistent with that, suggesting that the SPD was best able to win over FDP list voters where it was able to run a strong local campaign.

Formal Testing

Exploratory analyses of the split-ticket data, including diagrams such as Figures 1–6 (and others not reproduced here), have led to formal models of the universal patterns of straight-ticket and split-ticket voting in mixed-member systems. In general terms, we hypothesize that the volume of splitting in any constituency (measured as the percentage of a party's list contest votes) is a function of the 'destination' party's performance there at the 1994 election. For straight-ticket voting, this means that a party's ability to retain list supporters in its constituency contest should be related to one variable only – its own performance in the previous election in 1994. For split-ticket voting there should be two relationships: (1) because each party is better able to retain straight-ticket votes where it is strong, there should be a negative relationship between its 1994 performance and the percentage of its 1998 list voters who split to another party in the 1998 constituency contests; and (2) the stronger the 'destination' party's performance in 1994, the more split-ticket voters it should be able to attract to its 1998 constituency candidate.²⁶ Additionally, since some of our diagrams indicated differences between the constituencies in the former East and West Germany, a dummy variable representing that division of the country is introduced. We test these universal notions separately for straight-ticket and split-ticket voting across different parties.²⁷

Formally, the model for straight-ticket voting is:

$$(L_1 - C_1)_x = f(C_1(1994)_x, \text{EAST}_x) \quad (1)$$

where $(L_1 - C_1)_x$ is the estimated percentage of those who voted for party 1 in the 1998 list contest who also voted for its candidate in the constituency contest in constituency x ; $C_1(1994)_x$ is the percentage of the constituency votes won by party 1 at the 1994 election in constituency x ; and EAST_x is a dummy variable, coded 1 if constituency x is in the former East Germany, and 0 otherwise.

²⁶ Because we are using closed-number sets (i.e. percentages) there is the potential for collinearity among these independent variables in the split-ticket tests – but checks showed that these were not a problem (in part because in most constituencies the CDU and SPD dominated the voting).

²⁷ We have separate matrices for the former East and West Germany. Comparison of the two shows virtually no differences between the two parts of the country in the rows for CDU and SPD, or in that for the Greens: the volume of straight-ticket voting and the direction of split-ticket was the same in both parts of the country. There were substantial differences for the FDP, however: 93 per cent of those who voted FDP in the list contests voted FDP in the constituency contests in the West, compared with only 44 per cent in the East – where 21 per cent switched to the PDS. And, not surprisingly there were major differences in the volume and direction of splitting involving the PDS, because it contested only a small number of seats in the West. Given these patterns, we do not anticipate that separate entropy-maximizing analyses for the East and West would produce significantly different results from those analysed here: the FDP won only 2.8 per cent of all list votes cast in the East, and the differences between the two would be insignificant in the overall pattern, and the absence of PDS candidacies in many constituencies in the West is handled in the EM procedure. A full evaluation of the differences is beyond the scope of this article, however, and we intend to conduct and report one separately, as part of further testing of the robustness of the EM procedure.

For split-ticket voting, the model is:

$$(L_1 - C_2)_x = f(C_1(1994)_x, C_2(1994)_x, \text{EAST}_x) \quad (2)$$

where $(L_1 - C_2)_x$ is the estimated percentage of those who voted for party 1 in the 1998 list contest who voted for the candidate of party 2 in the constituency contest in constituency x ; $C_1(1994)_x$ is the percentage of the constituency votes won by party 1 at the 1994 election in constituency x ; $C_2(1994)_x$ is the percentage of the constituency votes won by party 2 at the 1994 election in constituency x ; and EAST_x is a dummy variable, coded 1 if constituency x is in the former East Germany, and 0 otherwise. In all cases, party 1 is the party voted for in the list contest and party 2 the party voted for in the constituency contest.

The models are fitted using ordinary least squares multiple regression.²⁸ In the straight-ticket voting model, we expected the regression coefficients for $C_1(1994)$ to be positive; in the split-ticket tests, we expected the regression coefficients for $C_1(1994)$ to be negative and those for $C_2(1994)$ to be positive. The regressions are run only for those constituencies in which both parties fielded a candidate in the 1994 and 1998 constituency contests in the case of split-ticket votes, and where the relevant party fielded a candidate at both dates in the case of straight tickets. For parties other than the PDS this was virtually every constituency, as the N s in Tables 3, 4 and 5 show.

Tables 3–5 give the regression results. The average goodness of fit – a mean R^2 of 0.61 – indicates considerable success with the models: six have an R^2 of 0.75 or greater. In addition, in every model fitted all of the regression coefficients are significant at the 0.001 level or better, and all had the expected sign.

The regression results for split tickets from the two parties in the ‘right’ bloc – the CDU and FDP – are in Table 3. (The model was not fitted for ticket splitting from the FDP to the two smaller ‘left’ bloc parties, because the survey matrix showed these to be negligible

TABLE 3 *Results of Regressions of Models 1 and 2 for the CDU and FDP*

List vote Constituency vote	CDU CDU	CDU FDP	FDP FDP	FDP CDU	FDP SPD
<i>a</i>	89.6	1.8	15.9	56.8	14.7
<i>b</i> ($C_1(1994)$)	<i>0.05</i> (0.01)	<i>−0.01</i> (0.004)	<i>2.80</i> (0.24)	<i>−2.35</i> (0.16)	<i>−0.56</i> (0.06)
<i>b</i> ($C_2(1994)$)	*	<i>0.47</i> (0.03)	*	<i>0.18</i> (0.02)	<i>0.11</i> (0.01)
<i>b</i> (EAST)	<i>−0.81</i> (0.14)	<i>0.92</i> (0.09)	<i>8.12</i> (0.70)	<i>−4.67</i> (0.46)	<i>−1.06</i> (0.18)
R^2	0.26	0.53	0.43	0.55	0.63
N	327		323		322

Note: For key to variables, see text. Significant regression coefficients at the 0.001 level are in italics; standard errors of regression coefficients in brackets.

*Variable not included.

²⁸ As the dependent variables and one of the independent variables are percentages, a case could be made for fitting logistic regressions. However, the scatter plots (as in Figures 1–6) suggested that this was unnecessary.

in volume.) The two regressions for straight-ticket voting (CDU–CDU and FDP–FDP) have positive coefficients for the relevant party's 1994 performance: the larger the party's vote share in 1994, the larger the percentage of its list voters who also supported the party's constituency candidate in 1998. Finally, the coefficients for EAST show that straight-ticket voting was very slightly lower for the CDU in East than West Germany, but nearly eight points higher for the FDP in the former East Germany than in the West.

The inter-party split tickets within this bloc also have regression coefficients with the expected signs. Thus splitting from the CDU to the FDP (i.e. the percentage of CDU list voters who supported the FDP candidate at the constituency contest) was greater the better the FDP's performance in 1994, but smaller the better the CDU's performance then – and was also slightly larger in the eastern than the western zone. Similarly, more voters switched from supporting the FDP in the list contest to the CDU in the constituency, the greater the CDU's chances of success in 1998 (as reflected in its 1994 performance), but fewer did so the better the FDP's performance there in 1994. There was exactly the same pattern for inter-bloc splits from the FDP to the SPD. Among FDP list voters who employed a split-ticket strategy, therefore, whether they switched to the CDU or the SPD was a function of both the FDP's own strength in the constituencies and which of the CDU and SPD was best placed to win there – although, as the constant values show, the average split to the CDU was larger than that to the SPD.

Table 4 reports on the nine regressions involving the various pairings of the three parties in the 'left' bloc. In all three cases, straight-ticket voting increased, the better the party's performance in 1994 – and hence chances of success in the constituency in 1998; the goodness-of-fit statistics were relatively small for the SPD and Greens, however. Similarly, for the inter-party split tickets, the better a party's performance in the constituency contest in 1994: (1) the larger the percentage of the other party's 1998 list supporters who split their vote and supported it in the constituency; and (2) the smaller the proportion of its own list voters who switched to the other party in the constituency contest. Finally, all nine cases had a significant average difference between constituencies in the former East and West Germany, but these were insubstantial in four of the nine regressions. Ticket splitting from the Greens to the SPD was substantially larger in the East than the West, however, as – not surprisingly – was straight-ticket PDS voting; by contrast, constituencies in the East had lower average values than those in the West in split-ticket voting involving switches from the PDS to the SPD and the Greens (reflecting the higher PDS loyalty in the East), and also in straight-ticket voting for the Greens.²⁹

'Other' parties almost invariably perform badly in the constituency contests: in 1994, for example, there was only one case of one of them achieving more than 10 per cent of the votes cast, and the mean was only 2.8 per cent. Not surprisingly, therefore, most of those who voted for an 'other' party in the list contest voted for another in the constituency race – most for either the CDU or the SPD (Table 1). If our interpretation of the other patterns holds for these voters, too, then the number who switch to another party should be related to its constituency strength. Table 5 contains the regressions for the four sets

²⁹ In the constituencies where the PDS did not field a candidate in 1998 – all of them in former West Germany – we regressed the switch from a PDS list vote to a constituency vote for each of the other four parties. Each produced a positive regression coefficient at the 0.001 level, with r^2 values of CDU, 0.22; to FDP, 0.46; to SPD, 0.49; and to Green, 0.19. The stronger a party, the better its ability to win over some of the small number of voters who supported the PDS in the list contests there. (The average PDS list percentage in those constituencies in 1998 was only 0.8, with a maximum of 2.8; in the West German constituencies where it fielded candidates in both 1994 and 1998 its average percentage was 1.3.)

TABLE 4 *Results of Regressions of Models 1 and 2 for the SPD, PDS and the Green Party*

List vote Constituency vote	SPD SPD	SPD Green	SPD PDS	Green Green	Green SPD
<i>a</i>	83.2	4.6	1.2	34.1	48.9
<i>b</i> (<i>C</i> ₁ (1994))	<i>0.13</i> (0.01)	<i>-0.06</i> (0.01)	<i>-0.01</i> (0.003)	<i>1.42</i> (0.12)	<i>-1.35</i> (0.11)
<i>b</i> (<i>C</i> ₂ (1994))	*	<i>0.25</i> (0.02)	<i>0.11</i> (0.04)	*	<i>0.37</i> (0.03)
<i>b</i> (EAST)	<i>-0.83</i> (0.20)	<i>-0.85</i> (0.13)	<i>0.48</i> (0.08)	<i>-4.96</i> (0.86)	<i>4.12</i> (0.74)
<i>R</i> ²	0.45	0.54	0.96	0.39	0.53
<i>N</i>	327	307	183	308	307
List vote Constituency vote	Green PDS	PDS PDS	PDS SPD	PDS Green	
<i>a</i>	1.2	37.9	36.7	7.7	
<i>b</i> (<i>C</i> ₁ (1994))	<i>-0.04</i> (0.01)	<i>0.84</i> (0.06)	<i>-0.53</i> (0.05)	<i>-0.14</i> (0.03)	
<i>b</i> (<i>C</i> ₂ (1994))	<i>0.11</i> (0.01)	*	<i>0.11</i> (0.03)	<i>0.56</i> (0.06)	
<i>b</i> (EAST)	<i>0.65</i> (0.09)	<i>16.00</i> (1.08)	<i>-9.64</i> (0.99)	<i>-3.17</i> (0.62)	
<i>R</i> ²	0.95	0.92	0.89	0.75	
<i>N</i>	167	184	183	167	

Note: For key to variables, see text. Significant regression coefficients at the 0.001 level are in italics; standard errors of regression coefficients in brackets.

*Variable not included.

TABLE 5 *Results of Regressions of Models 1 and 2 for Those who Voted for 'Other' Parties in the List Contest*

List vote Constituency vote	Other Other	Other CDU	Other SPD	Other PDS
<i>a</i>	38.4	30.5	13.3	6.5
<i>b</i> (<i>C</i> ₁ (1994))	<i>3.70</i> (0.26)	<i>-2.30</i> (0.16)	<i>-0.85</i> (0.07)	<i>-0.66</i> (0.12)
<i>b</i> (<i>C</i> ₂ (1994))	*	<i>0.21</i> (0.03)	<i>0.08</i> (0.02)	<i>0.31</i> (0.03)
<i>b</i> (EAST)	<i>-4.52</i> (1.25)	<i>-3.38</i> (0.76)	<i>-1.66</i> (0.35)	<i>4.58</i> (0.70)
<i>R</i> ²	0.47	0.44	0.51	0.85
<i>N</i>	293	293	293	151

Note: For key to variables, see text. Significant regression coefficients at the 0.001 level are in italics; standard errors of regression coefficients in brackets.

*Variable not included.

of switches involving those who voted for 'other' parties in the list contests – excluding the minimal shifts to the FDP and Greens. Although three of the four R^2 values are relatively small (the exception is split-ticket votes from 'other' to PDS), the pattern is entirely consistent with the other findings. The greater a party's chances of winning in the constituency contest in 1998 (as indexed by its 1994 performance) the larger the percentage of 'other' party list voters who switched their constituency vote to that party – and also the larger the percentage who voted a straight 'other' ticket.

Campaign Effects and Inter-Bloc Ticket Splitting

These findings provide strong support for our split-ticket vote hypothesis. A considerable proportion of the German electorate gave their constituency vote to a candidate from another party within the same left or right 'bloc' with a good chance of winning the contest there, whatever their preferences as indicated by their list votes. There were also some splits across the 'boundary' between the two main party blocs: FDP list voters were more likely to vote for the SPD candidate in the constituency contest, if the SPD's party's chances there were better (Table 3). The reason for this, we suggested, was that the stronger a party's presence in a constituency the more intensive its campaign there, and so the greater the probability of it attracting constituency contest votes from other lists (some of which might well be personal votes for incumbents, although because of the considerable continuity in voting at the constituency contests over time, it is very difficult to disentangle potential 'party incumbency' from 'candidate incumbency' effects).³⁰ We test whether this is the case for the other inter-bloc switches (other than those which were trivially small, according to the national matrix (Table 1), and those to the 'other' parties).

The eight regressions have an average R^2 value of 0.57 (Table 6) and twenty-one of the twenty-four regression coefficients are significant at the 0.001 level or better. All of the coefficients for the candidate variables have the expected signs (negative for the party which won the list vote; positive for the party which won the constituency vote), and similarly all the coefficients for the 'origin' and 'destination' party's strength at the 1994 election have the expected signs – negative in the former case, positive in the latter. Thus the better a party performed in 1994, the better it was able both to prevent split-ticket votes (the regressions in Tables 3–4) and to attract them from across the party-bloc divide.

These switches were all relatively small in volume, as shown by the constant terms – the largest averaged only 5.1 per cent across the constituencies involved, and the inter-constituency variation was relatively slight (Table 2). And, as the regression coefficients for $C_1(1994)$ and $C_2(1994)$ show, the trends were positive but shallow. Nevertheless they were all significant and they suggest that local party campaigns can win over some split-ticket votes in unexpected directions – some voters like to give potential winners a chance.

CONCLUSIONS

One in five German voters split their ticket at the 1998 Federal election, voting for a different party in the list and constituency contests. Split-ticket voting is a rational response in certain (probably most) circumstances; where a party has little chance of victory in the constituency contest its supporters in the list contest are more likely to influence the

³⁰ On which see Bawn, 'Voter Responses to Electoral Complexity'; Lancaster, 'Candidate Characteristics and Electoral Performance'.

TABLE 6 *Results of Regressions of Model 2 for Inter-Bloc Split-Tickets*

List vote Constituency vote	CDU SPD	CDU Green	CDU PDS	SPD CDU
<i>a</i>	2.8	0.2	0.3	5.5
<i>b</i> (C_1 (1994))	- 0.002 (0.003)	- 0.006 (0.001)	- 0.002 (0.001)	- 0.029 (0.003)
<i>b</i> (C_2 (1994))	0.04 (0.001)	0.03 (0.002)	0.02 (0.001)	0.02 (0.003)
<i>b</i> (EAST)	0.18 (0.04)	- 0.05 (0.02)	0.10 (0.02)	- 0.16 (0.05)
R^2	0.67	0.42	0.96	0.61
N	326	307	183	326
List vote Constituency vote	SPD FPD	Green CDU	PDS CDU	PDS FDP
<i>a</i>	0.3	1.1	3.9	1.0
<i>b</i> (C_1 (1994))	- 0.001 (0.001)	- 0.020 (0.002)	- 0.040 (0.006)	- 0.011 (0.007)
<i>b</i> (C_2 (1994))	0.13 (0.01)	0.002 (0.001)	0.02 (0.003)	0.24 (0.03)
<i>b</i> (EAST)	0.35 (0.04)	0.04 (0.01)	- 1.47 (0.11)	- 0.09 (0.13)
R^2	0.37	0.29	0.90	0.33
N	322	307	183	179

Note: For key to variables, see text. Significant regression coefficients at the 0.001 level are in italics; standard errors of regression coefficients in brackets.

constituency outcome if they transfer their support to another party with a greater chance of success. Not surprisingly, most voters who exercised that option cast their constituency vote for another party in the same bloc (right or left) on the political spectrum.

At the national level, the constituency contests are dominated by the two largest parties – CDU and SPD – and the pattern of split-ticket voting demonstrates them to be the main beneficiaries. Our estimates of the volume of split-ticket voting in each constituency, however, show not only that the degree to which the two parties benefited varied considerably across the 328 constituencies in 1998 but also that this variation was linked to their chances of success there: the better their performance in a constituency in 1994, the better their assumed chances of success in 1998, and the more intra-bloc split-ticket votes they attracted. Interestingly, this applied also to the smaller parties: although they had little chance of victory in the great majority of constituencies, if their performance was better in 1994 not only were they better able to retain list support in 1998 (i.e. win a larger proportion of straight-ticket votes), they were also better able to attract split-ticket votes from other parties within their bloc. Finally, the same patterns were observed in cross-bloc ticket splitting; the better a party's performance in 1994, the greater its ability to attract support from whatever sources.

Not all of these findings appear consistent with our hypotheses based on rational voter theory. However, as Downs pointed out in his classic work, rational behaviour requires information, which is expensive to collect in terms of time and other resources.³¹ Given the very low probability that any one voter will be pivotal in a contest, therefore, the rational action may well be either to cast a straight ticket using the party label heuristic rather than waste time gathering and evaluating information, or to abstain. Political parties act to counter this by providing information, through their campaigning and canvassing activities, and studies in a variety of countries have shown that: (1) the more money that is spent on a constituency campaign the greater the turnout; and (2) the more an individual party campaigns, the better its performance there relative to that of its opponents.³² In general terms, the intensity of a party's constituency campaign is related to its electoral strength, so that in any constituency the parties best able to campaign for both straight-ticket and split-ticket votes should be those with the best electoral records. The findings of this exploratory study of spatial variations in straight-ticket and split-ticket voting in Germany in 1998 are consistent with those expectations: further research is necessary to explore the hypothesized relationships and the underlying causal links in more detail.

³¹ A. Downs, *An Economic Theory of Democracy* (New York: Harper, 1957).

³² See, for example, D. Denver and G. Hands, *Modern Constituency Electioneering: The 1992 General Election* (London: Frank Cass, 1997).